

## Amendment to the Claims

### 1-15. (Cancelled)

16. (Currently Amended) A system for prediction and treatment of all kinds of slugs ~~being~~ formed in a flow line ~~(20) system or wellbore tubing transporting~~ a multiphase fluid towards a downstream process including at least one separator or slug catcher ~~(8)~~ at an inlet of said downstream process ~~inlet~~, wherein said system comprises:

a slug detector ~~(1) dedicated to detect~~ for detecting any incoming slug, ~~said slug detector being which~~ is located between ~~at the~~ point of slug initiation and the inlet of said downstream process ~~inlet~~;

wherein said slug detector comprises instruments in said flow line for measuring flowing pressure, fluid mixture density and at least one of gas void fraction, water cut and local liquid hold-up;

an inlet choke positioned in said flow line;

a multiphase flow meter or a fluid velocity meter located upstream of said inlet choke;

a computer unit, ~~(4) connected to said slug detector (1) and either of said~~ a multiphase flow meter ~~(5) or said~~ a fluid velocity meter ~~located upstream an inlet choke (19) in said flow line (20) system, said computer unit including and where said unit (4) includes~~ software, which based on signals from said slug detector ~~(1)~~ in combination with signals from either said multiphase flow meter (5) or said fluid velocity meter, is capable of determining ~~determines~~ the nature of the detected ~~said~~ slug and estimating ~~estimates~~ its volume and its arrival time to said downstream

~~process,~~process;

instruments connected to said computer unit (4) ~~for~~ continuously monitoring pressure and liquid levels in said separator or said slug eater~~er, catcher;~~ and

at least one device, connected to said separator or said slug catcher, for receiving ~~which receives~~ signals from said computer unit (4) ~~to regulate and regulating~~ the pressure and/or liquid level in said separator or said slug catcher so that process perturbations due to incoming slugs are reduced to a minimum through said downstream process.

17. **(Currently Amended)** A system according to claim 16, wherein said instruments comprise at least one liquid level transmitter (9,11,18) and/or at least one pressure transmitter (3,16) mounted to said separator or said slug catcher.

18. **(Currently Amended)** A system according to claim 16, wherein said device comprises at least one valve (6,7,12,17) and/or at least one compressor (14) and/or at least one pump (15).

19. **(Cancelled)**

20. **(Currently Amended)** A system according to claim 16, wherein the distance (2) from the slug detector (1) to the downstream process equipment is for every new implementation optimized with respect to slug treatment capabilities of said process and the parameter settings of all regulating devices being controlled by said computer unit (4).

21. **(Currently Amended)** A system according to claim 16, wherein the ~~optimum~~ location for said slug detector (1) ~~is in -could either be in-~~ said flow line (20) ~~a specified~~ some distance (2) upstream of said downstream process or within a riser (13).

22. **(Currently Amended)** A system for prediction and treatment of all kinds of slugs formed in a flow line transporting a multiphase fluid towards a downstream process including at least one separator or slug catcher at an inlet of said downstream process, wherein said system comprises:

a slug detector for detecting any incoming slug, said slug detector being located between a point of slug initiation and the inlet of said downstream process,

an inlet choke positioned in said flow line;

a multiphase flow meter or a fluid velocity meter located upstream of said inlet choke;

a computer unit, connected to said slug detector and either of said multiphase flow meter or said fluid velocity meter, said computer unit including software, which based on signals from said slug detector in combination with signals from either said multiphase flow meter or said fluid velocity meter, is capable of determining the nature of the detected slug and estimating its volume and its arrival time to said downstream process;

instruments connected to said computer unit for continuously monitoring pressure and liquid levels in said separator or said slug catcher; and

at least one device, connected to said separator or said slug catcher, for receiving signals from said computer unit and regulating the pressure and/or liquid level in said separator or said slug

catcher so that process perturbations due to incoming slugs are reduced to a minimum through said downstream process.

\_\_\_\_\_ A system according to claim 16, wherein the computer unit (4) includes the following three options for defining the fluid velocities; velocities: (1) by manual input, input; (2) by on-line registration using a clamp-on fluid velocity meter; or (3) by including an on-line transient simulator in combination with a multiphase meter (5) at the flow line outlet.

23. **(Currently Amended)** A system according to claim 16, wherein the computer unit (4) integrates said flow line system (20) and said downstream process by adjusting the pressure and liquid level regulating devices based on ~~arrival~~ received slug information.

24. **(Currently Amended)** A system for prediction and treatment of all kinds of slugs formed in a flow line transporting a multiphase fluid towards a downstream process including at least one separator or slug catcher at an inlet of said downstream process, wherein said system comprises:

\_\_\_\_\_ a slug detector for detecting any incoming slug, said slug detector being located between a point of slug initiation and the inlet of said downstream process;

\_\_\_\_\_ an inlet choke positioned in said flow line;

\_\_\_\_\_ a multiphase flow meter or a fluid velocity meter located upstream of said inlet choke;

\_\_\_\_\_ a computer unit, connected to said slug detector and either of said multiphase flow meter or said fluid velocity meter, said computer unit including software, which based on signals from said slug detector in combination with signals from either said multiphase flow meter or said fluid

velocity meter, is capable of determining the nature of the detected slug and estimating its volume and its arrival time to said downstream process;

instruments connected to said computer unit for continuously monitoring pressure and liquid levels in said separator or said slug catcher; and

at least one device, connected to said separator or said slug catcher, for receiving signals from said computer unit and regulating the pressure and/or liquid level in said separator or said slug catcher so that process perturbations due to incoming slugs are reduced to a minimum through said downstream process;

A system according to claim 16, wherein the computer unit (4) comprises override functions that override or suppress the slug control regulation of the downstream process if the trip levels of the separators are approached.

25. **(Currently Amended)** A method for prediction and treatment of all kinds of slugs being formed in a flow line ~~(20) system or wellbore tubing~~ transporting a multiphase fluid towards a downstream process that includes ~~including~~ at least one separator or slug catcher ~~(8)~~ at an inlet of said downstream ~~process inlet~~, wherein said method comprises ~~the following steps:~~

detecting said slug ~~is detected~~ between ~~the~~ a point for slug initiation in said flow line ~~(20)~~ and said downstream process inlet by means of a slug detector ~~(1)~~, the nature of said slug ~~being~~ is determined by means of a computer unit ~~(4)~~ continuously receiving signals from said slug detector ~~(1)~~ in combination with either a fluid velocity meter or a multiphase flow meter ~~(5)~~ located upstream of an inlet choke ~~(19)~~ in said downstream process.

wherein said slug detector continuously records flowing pressure, fluid mixture density and at least one of gas void fraction, water cut and local liquid hold-up;

estimating the volume of said slug and its arrival time to said downstream process ~~are estimated by said computer unit (4);~~

regulating pressures and liquid levels in said separator or slug catcher ~~are monitored by said computer unit (4) by means of instruments (3,9,11,16,18) mounted to said separator or slug catcher;~~ and

sending signals from said computer unit (4) ~~gives signals to~~ at least one device ~~(6,7,12,14,15,17)~~ that is connected to said separator or slug catcher to regulate the pressure and/or liquid level in said separator or slug catcher so that process perturbations due to incoming slugs are reduced to a minimum through said downstream process.

**26. (Cancelled)**

**27. (Currently Amended)** A method according to claim 25, wherein said ~~pressures~~ pressure and/or liquid levels are regulated by means of at least one valve ~~(6,7,12,17)~~ and/or at least one compressor ~~(14)~~ and/or at least one pump ~~(15)~~ connected to said separator or slug catcher.

**28. (Currently Amended)** A method according to claim 25, wherein said pressure regulation is achieved by adjusting a choke opening of at least one gas outlet valve ~~(6,17)~~ or by adjusting the speed of a downstream compressor ~~(14)~~.

29. **(Currently Amended)** A method according to claim 25, wherein said liquid level regulation is achieved by adjusting a choke opening of at least one liquid outlet valve ~~(7,12)~~ or by adjusting the speed of a ~~down-stream~~ downstream pump ~~(15)~~.

30. **(Currently Amended)** A method according to claim 25, wherein the flow rate in said flow line is adjusted by means of said inlet choke ~~(19)~~.